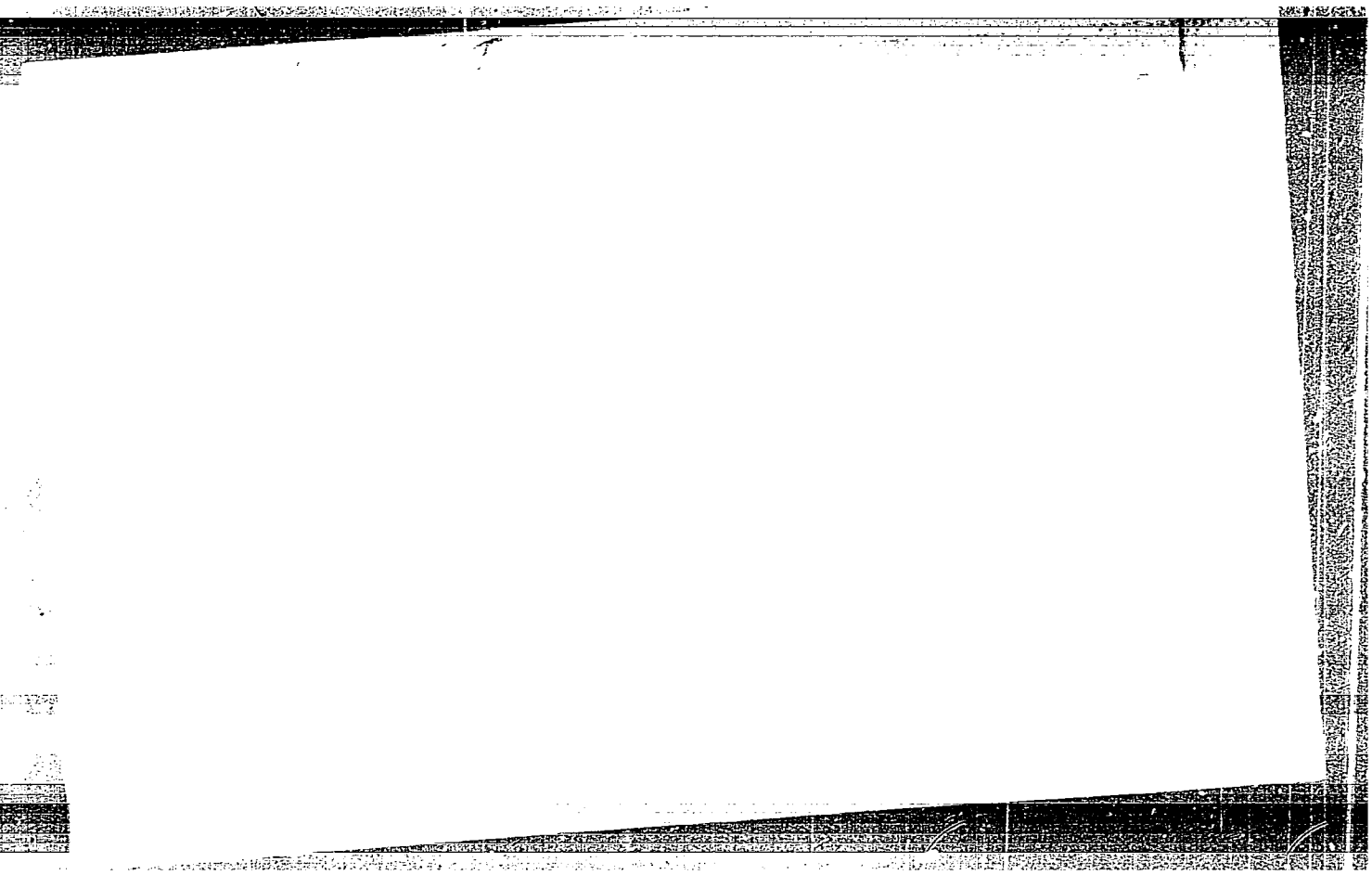

APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653720010-6"

SUCHIL'NIKOV, S. I.

K vaprosu ob izvlechechii dorogostoyashchikh elementov v protesse ikh proizvodstva.

report submitted for the 5th Physical Chemical Conference on Steel Production Moscow, 30 Jun 1959.

SOV/133-59-5-13/31

AUTHORS: Suchil'nikov, S.I. and Melikhov, V.V., Candidates of Technical Sciences, Docent

TITLE: Heat Balance of Aluminothermic Smelting of Ferrotitanium (Teplovoy balans alyuminotermicheskoy plavki ferrotitana)

PERIODICAL: Stal', 1959, Nr 5, pp 425 - 428 (USSR)

ABSTRACT: A method of calculating heat balance of the aluminothermal smelting of ferrotitanium based on theoretical concepts developed by V.A. Bogolyubov (Ref 1) is described. Specific heat of the process was calculated from an equation:

$$\delta H = \frac{Q}{m} = Gt \qquad (1)$$

where Q is the amount of heat evolved during the process,
m is the mass of charged materials,
G is the thermal coefficient which accounts for mean heat capacity of the charged materials and specific heat losses,
t - temperature of the process.

Card1/3

Heat Balance of Aluminothermic Smelting of Ferrotitanium

By determining the heat coefficient G from Eq (1) and mean heat capacity of the charge C , heat losses can be approximately calculated from equation:

$$q = \frac{G - C}{G} \cdot 100\% \qquad (1) .$$

Specific heat of the process was determined in a calorimeter of about 100 litres capacity. For the industrial heats thermocouples were inserted in 11 points, as shown in Figure 1. Smelting was done with bottom ignition in a cast iron shaft furnace of 1 400 mm internal diameter and 1 250 mm high lined with magnesite. For calculating heat losses from temperature measurements the surface of the furnace was divided into 4 sectors and the whole process into two periods of 5 min each. Heat losses were found to be about 18% of which 94.2% was used for heating the furnace (titanium recovery - 74.7%, utilisation of aluminium - 82.5%). In order to determine

SUCHIL'NIKOV, S.I., kand.tekhn.nauk; DUBROV, N.F., kand.tekhn.nauk

Perfect the design of electric arc furnaces and improve the quality of electrical steel. Trudy Ural.politekh.inst. no.75: 133-141 '59. (MIRA 13:4)
(Electric furnaces) (Steel--Electrometallurgy)

SUCHIL'NIKOV, S.I.; GEL'D, P.V., doktor tekhn.nauk

Certain peculiarities in the roasting of molybdenum concentrates. Trudy Ural.politekh.inst. no.75:219-232 '59. (MIRA 13:4)

(Molybdenum--Metallurgy)

S/020/60/135/005/037/043
B016/B052

AUTHORS: Pliner, Yu. L. and Suchil'nikov, S. I.

TITLE: Estimating the Rate of Sinking of Ferrotitanium Drops in Molten Slag

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 5, pp. 1187-1189

TEXT: The authors report on the investigation of the loss of ferrotitanium in slag during aluminothermal melting. They recommend measurements for the elimination of such losses (up to 10% of the total weight). The time during which the slag remains liquid is too short for the complete sinking of drops in the slag (Ref. 1). In Ref. 2, the authors mention that the motion of one drop has the following velocity: $V = V_0 \frac{3\eta+3\eta'+\varepsilon^2\varkappa^{-1}}{2\eta+3\eta'+\varepsilon^2\varkappa^{-1}}$ (1), where V_0 denotes the velocity of motion of a solid ball of the same radius as the drop; η is the viscosity of the slag; η' is the viscosity of the metal drop; ε is the charge per unit area of the drop; and $\varkappa$ is the elec-

Card 1/4

trical conductivity of the slag. Since practically no retardation of the tangential motion of the liquid within the drop takes place when $\eta + \eta' \gg \varepsilon^2 \varkappa^{-1}$, equation (1) (considering that $\eta \gg \eta'$) takes the form of $V = 3/2\ V_0$ (2). After comparing published data (V. V. Khlynov and O. A. Yesin, Ref. 4) with the viscosity of ferrotitanium slag (4.8 poise), the authors suggest the following approximate equation for the velocity of motion of the metal drop in the slag: $V = \frac{V_0 + 3/2V_0}{2} = 1.25\ V_0$ (3), or

$V = 1.25 \cdot 2/9 \cdot \frac{r^2 g(\gamma_2 - \gamma_1)}{\eta} = 272{,}5\ \frac{r^2(\gamma_2 - \gamma_1)}{\eta}$ (4), where r is the radius of the drop, γ_2 and γ_1 are the density of drop and slag, respectively. A comparison of the grain size of scrap aluminum (0.42 mm) used formerly with that of the metal drop in the slag (0.36 ± 0.03 mm) showed that they are practically equal. Fig. 1 shows the viscosity of slag between 1450° and 1750°C measured with an electromagnetic vibrating viscosimeter. A

thermocouple of the type ЦНИИЧМ-1 (TsNIIChM-1), designed at the Central Scientific Institute of Ferrous Metallurgy was used for measuring temperature. The considerably high viscosity at high temperatures is due to the presence of slightly mobile ions mainly of AlO_2^- (Ref. 8). Equation (4) can only be applied for the sinking rate of drops as long as the motion remains laminar. This is only the case until the critical rate of $V = c \frac{\eta}{\gamma_2 \cdot r}$ (5) is reached (where c is the Reynolds criterion). The authors combine equations (4) and (5) to obtain the maximum value of the drop radius at which the motion is still laminar, namely: $r_{max} = 0.97$ cm. Since this value exceeds considerably the size of metal drops formed during reduction, the authors calculate the sinking rate of the ferrotitanium drops. From these data they conclude that only drops larger than 0.2 mm can sink down to the metal layer. Drops with a radius of 0.05 mm and less are practically all kept back in the slag. For the elimination of losses, the authors suggest: a) the use of aluminum shot with a grain size of 0.1 - 0.2 mm; b) melting in a heated forge or in an electric furnace of

SUCHIL'NIKOV, S. I.

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PHASE I BOOK EXPLOITATION SOV/5411

Konferentsiya po fiziko-khimicheskim osnovam proizvodstva stali. 5th, Moscow, 1959.

Fiziko-khimicheskiye osnovy proizvodstva stali; trudy konferentsii (Physicochemical Bases of Steel Making; Transactions of the Fifth Conference on the Physicochemical Bases of Steelmaking) Moscow, Metallurgizdat, 1961. 512 p. Errata slip inserted. 3,700 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut metallurgii imeni A. A. Baykova.

Responsible Ed.: A. M. Samarin, Corresponding Member, Academy of Sciences USSR; Ed. of Publishing House: Ya. D. Rozentsveyg. Tech. Ed.: V. V. Mikhaylova.

Card 1/16

Physicochemical Bases of (Cont.) SOV/5411

PURPOSE: This collection of articles is intended for engineers and technicians of metallurgical and machine-building plants, senior students of schools of higher education, staff members of design bureaus and planning institutes, and scientific research workers.

COVERAGE: The collection contains reports presented at the fifth annual convention devoted to the review of the physicochemical bases of the steelmaking process. These reports deal with problems of the mechanism and kinetics of reactions taking place in the molten metal in steelmaking furnaces. The following are also discussed: problems involved in the production of alloyed steel, the structure of the ingot, the mechanism of solidification, and the converter steelmaking process. The articles contain conclusions drawn from the results of experimental studies, and are accompanied by references of which most are Soviet.

SUCHIL'NIKOV, S.I.; SOKOLOV, V.Ye.; IGNAT'YEV, V.S.

Slag viscosity in the industrial smelting of ferrotitanium. Trudy Ural. politekh. inst. no.116:110-118 '61. (MIRA 16:6)
(Titanium-iron alloys) (Slag—Testing)

MELIKHOV, V.V.; SUCHIL'NIKOV, S.I.

Methods of establishing the heat balance in the metallothermic smelting of ferroalloys. Trudy Ural. politekh. inst. no.116: 119-129 '61. (MIRA 16:6)
(Iron alloys—Metallurgy) (Aluminothermy)

S/148/61/000/011/005/018
E071/E180

AUTHORS: Pliner, Yu.L., and Suchil'nikov, S.I.

TITLE: On factors determining the temperature of alumino thermal smelting outside a furnace

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, no.11, 1961, 71-75

TEXT: Main factors determining the temperature of the alumino-thermic processes carried out outside furnaces are discussed. It is pointed out that the process is possible only if the temperature exceeds the melting point of the oxide being reduced. The temperature at which the process can start can be determined from a modified equation of N.N. Murach and U.D. Veryatin (Ref.6: Vnepechnaya metallotermiya, TsIIN, Metallurgizdat, 1956):

$$\log t_{process} = \frac{t_{melt.}}{3600} + 2.81 \qquad (6)$$

where: $t_{process}$ - temperature at which the process can start, and

Card 1/2

SUCHIL'NIKOV, S.I.; SOKOLOV, V.Ye.; VOYNOV, V.V.

Viscosity of alumina titanium slags. Izv. vys. ucheb. zav.; chern. met. 4 no.10:42-45 '61. (MIRA 14:11)

1. Ural'skiy politekhnicheskiy institut.
(Titanium--Iron alloys--Metallurgy) (Slag)

3558

S/148/62/000/002/003/008
E193/E383

AUTHORS: Ignat'yev, V.S., Ignatenko, G.F., Suchil'nikov, S.I. and Pliner, Yu.L.

TITLE: Material and heat-balance of smelting metallic chromium in an electric-arc furnace

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, no. 2, 1962, 65 - 72

TEXT: A new method of chromium smelting, cheaper than the conventional process, had been proposed by the present authors and the object of the investigation described in the present paper was to check the efficiency of this process by compiling its material and heat-balances. The salient feature of the new process is the elimination from the charge of that portion of sodium nitrate which is normally used to provide heat required to ensure correct running of the smelting process and separation of the slag from the metal. In the new method a portion of oxides and fluxes constituting the total weight of the charge is fused in a three-phase electric-arc furnace and serves as a physical source of heat required in the reducing stage of the

Card 1/8

Material and heat-balance ....

process. The smelting experiments were carried out in a 750 kVA furnace equipped with a magnetite-lined cast-iron melting shaft, provision having been made for insertion of several thermocouples. The temperature of the charge was measured from the moment of ignition of the combustible mixture added to the charge to form a liquid phase. When this had been formed, the furnace electrodes were lowered, current was switched on and the chromium oxide/lime mixture was smelted. The electrodes were then withdrawn and the reducing portion of the charge (chromium oxide and aluminium in the quantity required to reduce both the solid and fused oxides) was introduced into the melt. The composition of the charge, divided into igniting, ore-bearing and reducing portions (denoted by A, Б and B, respectively) is given below (kg):

S/148/62/000/002/003/008
E193/E383

Material and heat-balance ....

	A	S	B	Total
Technical chromium oxide (98.23% Cr_2O_3)	200	500	1620	2320
Aluminium grain (97% Al)	76	-	766	842
Lime (85% CaO)	-	200	-	200
Saltpetre (98% $NaNO_3$)	16	-	-	16
Total ...	292	700	2386	3378 .

The various elements content (in kg) of the charge was:

Chromium $2320 \times 0.9823 \times \frac{104}{152} = 1558.8$;

Aluminium $842 \times 0.97 = 816.7$;

Iron $2320 \times 0.0015 \cdot \frac{56}{72} + 842 \times 0.0036 = 5.73$;

Silicon $2320 \times 0.005 \quad \frac{28}{60} = 5.42$.

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S/148/62/000/002/003/008
E193/E383

Material and heat-balance ....

The 767.8 kg Al used up in the process was made up as follows: 763.3 kg for reducing the chromium oxide, 3.48 kg and 0.92 kg for the reduction of silicon and iron, respectively, and 3.5 kg included in the metal produced. The process yielded 1 456 kg of crude chromium (Cr 99.06%, Si 0.24%, Al 0.24%, Fe 0.41%, C 0.019%, S 0.016%, P 0.007%), equivalent to 91.6% recovery, the degree of utilization of Al being 94.4%. Regarding the heat-balance, the total duration of the process was 1 hour 44 min, of which 1 hour 27 min constituted the smelting stage (with the current switched on) and the remainder represented the duration of the reducing stage. The temperature of the melt was 1 870 °C, the temperature of the process being 2 100 °C. The integrated heat-balance calculated for these conditions was as follows:

Card 4/8

S/148/62/000/002/003/008
Material and heat-balance E193/E383

Heat supplied	kcal	%
By exothermic reducing reactions	1861887	70.6
By electrical energy	773245	29.4
Total	2635132	100.0

Heat consumed	kcal	%
Heat content of the metal	623750	23.64
Heat content of the slag	1269620	48.21
Heat losses	735416	27.91
Unaccounted-for losses	6346	0.24
Total	2635132	100.0

Card 5/8

S/148/62/000/002/003/008
E193/E383

Material and heat-balance ....

The heat-balance for the smelting stage was as follows:

Heat supplied by	kcal	%
Decomposition of saltpetre by aluminium	52496	5.35
Exothermic reaction of aluminium reduction of chromium oxide	155981	15.88
Electric arcs	773245	78.76
Total	981722	100.0

Card 6/8

S/148/62/000/002/003/008
E193/E383

Material and heat-balance ....

Heat consumed	kcal	%
Heat of electric arcs absorbed by the melt	274100	27.9
Heat of electric arcs used up to compensate the heat losses	499145	50.9
Heat of ignition used up to compensate the heat losses	134559	13.7
Heat of ignition absorbed by the slag	73918	7.5
Total	981722	100.0

It will be seen that only 34.8% of the electrical energy was used up to heat the melt, the remaining 65.2% being used to compensate for heating losses. In spite of this low thermal efficiency, the application of electrical power for melting a portion of chromium oxide made it possible completely to exclude saltpetre from the charge and to reduce the

Card 7/8

Material and heat-balance ....

consumption of aluminium by 81 kg/t of the melt, as a result of which the cost of producing crude chromium was reduced by 4%. It is pointed out in this connection that the furnace used in the new process should be equipped with a roof to minimise heat losses. There is 1 figure.

ASSOCIATION: Ural'skiy politekhnicheskiy institut
(Ural' Polytechnical Institute)

SUBMITTED: June 23, 1961

X

Card 8/8

39066

S/148/62/000/005/003/009

E071/E135

18.1135

AUTHORS: Suchil'nikov, S.I., Ignatenko, G.F., Pliner, Yu.L., Ignat'yev, V.S., and Lappo, S.I.

TITLE: The technology of aluminothermic smelting of metallic chromium in an electric arc furnace

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, no.5, 1962, 78-85

TEXT: The following modified technology was investigated: preliminary melting of a part of the chromium oxide charge with addition of lime in an electric arc furnace, lifting the electrodes, adding the remaining part of the charge and finishing the process in the usual way. A part of the thermal energy is supplied by the electric arc, thus reducing the consumption of aluminium and eliminating the need for potassium nitrate (except for a small amount used for the initial ignition). In addition, the quality of the metal produced can be improved, since a part of the carbon present in chromium oxide will become oxidised, so that metal with a lower C and N content can be obtained. The experiments were carried out in an open semi-industrial arc

Card 1/2

IGNATENKO, G.F.; SUCHIL'NIKOV, S.I.; PLINER, Yu.L.; IGNAT'YEV, V.S.; KONEV, A.F.

Making chromium metal in arc furnaces by aluminothermy. Stal' 22 no.2:137-139 F '62. (MIRA 15:2)

1. Klyuchevskiy zavod ferrosplavov i Ural'skiy politekhnicheskiy institut.

(Chromium—Electrometallurgy)
(Aluminothermy)

PLINER, Yuriy L'vovich; SUCHIL'NIKOV, Sergey Ivanovich; RUBINSHTEYN, Yevsey Abramovich; LEPINSKIKH, B.M., red.; KORKOVINA, N.A., tekhn. red.

[Aluminothermy in the production of ferroalloys and addition alloys] Aliuminotermicheskoe proizvodstvo ferrosplavov i ligatur. Moskva, Metallurgizdat, 1963. 174 p. (MIRA 16:10)

(Iron alloys--Metallurgy) (Aluminothermy)

BAUM, B.A.; GEL'D, P.V.; SUCHIL'NIKOV, S.I.

Electric conductivity of liquid chromium silicides. Fiz. met. i metalloved. 16 no.6:939-941 D '63. (MIRA 17:2)

1. Ural'skiy politekhnicheskiy institut imeni Kirova.

KUROCHKIN, K.T.; SUCHIL'NIKOV, S.I.; BAUM, B.A.

Vacuum treatment of liquid aluminothermic chromium. Izv. vys. ucheb. zav.; chern. met. 6 no.10:58-61 '63. (MIRA 16:12)

1. Ural'skiy politekhnicheskiy institut.

ZHUCHKOV, V. I.; SUCHIL'NIKOV, S. I.; MIKULINSKIY, A. S.; MOLEVA, N. G.

Electric resistance of ore and lime mixtures used in the manufacture of metallic chromium. Izv. vys. ucheb. zav.; chern. met. 7 no. 4:62-67 '64. (MIRA 17:5)

1. Ural'skiy politekhnicheskiy institut.

ACCESSION NR: AP4029838 S/0279/64/000/002/0149/0155

AUTHOR: Baum, B. A. (Sverdlovsk); Gel'd, P. V. (Sverdlovsk); Suchil'nikov, S. I. (Sverdlovsk)

TITLE: The electrical conductivity of chromium, silicon, and chromium disilicide in the solid and liquid states

SOURCE: AN SSSR. Izv. Metallurgiya i gornoye delo, no. 2, 1964, 149-155

TOPIC TAGS: silicide, chromium, silicon, valent state, KM-1 silicon

ABSTRACT: The authors investigated the electroconductivity of phase components of the chromium-silicon system in which the properties, especially in a liquid state, have not been adequately studied. Measurements were made within ranges of 5-1925°C for chromium, 700-1830°C for silicon, and 15-1881°C for $CrSi_2$. Measurement results are presented in graphs. The authors found that a specific resistance of electrolytic chromium at 20°C was 14.1 μΩ/cm and rapidly increased with temperature, reaching 145.5 μΩ at 1800°C. This differed somewhat from previous results. The temperature dependence of the electroconductivity of pure silicon agreed quite well with previous data. Chromium disilicide has an electroconductivity in a solid state which changes with the temperature according to the extreme law, reaching a minimum

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ACCESSION NR: AP4029838

near 385°C. In addition, the stable parameters of the proper conductivity of disilicide (ΔE=0.92 eV) is obtained at temperatures somewhat exceeding 385°C (for which ΔE=0). The discontinuous increase of electroconductivity observed at the melting point of $CrSi_2$ showed that its transition in the liquid state was accompanied by substantial change in the nature of interparticle interaction. Obviously transformation of the homeopolar bonds into metallic bonds occurred; i.e., processes similar to those observed in the melting of a number of semiconductors (Ge, Si, Si-Ge) and semimetals (Bi, Sb, Bi-Sb). The limited interval of the temperatures studied did not permit the completion of this process to be detected. However, in all the temperatures studied, the electroconductivity of chromium disilicide was considerably less (appx. 3 times) than σ of the fused components and could be examined as an indication of its retention of adequately-stable quasi-molecular groups (Cr-Si or Si-Cr-Si). From this viewpoint, liquid chromium silicides are in many ways reminiscent of silicides of other transitional metals (Mn, Fe, Co). Orig. art. has: 3 figures and 4 formulas.

ASSOCIATION: none

SUBMITTED: 12Aug63 DATE ACQ: 30Apr64 ENCL: 00

SUB CODE: ML NO REF SOV: 023 OTHER: 002

Card 2/2

SUCHIL'NIK[illegible]; PONOMARENKO, A.G.; DERYABIN, Yu.A.; PAVLOV, V.A.

Reduction of iron oxides from ilmenite concentrates by solid carbon. Report No.1. Izv.vys.ucheb.zav.; chern.met. 8 no.6:10-15 '65. (MIRA 18:8)

1. Ural'skiy politekhnicheskiy institut.

SUCHIL'NIKOV S I

L 27429-66 EWT(m)/T/EWP(t) IJP(c) JD/JG

ACC NR: AP6017686 SOURCE CODE: UR/0363/65/001/008/1289/1295

AUTHOR: Baum, B. A.; Gel'd, P. V.; Radovskiy, I. Z.; Suchil'nikov, S. I. 46

ORG: Ural Polytechnic Institute (Ural'skiy politekhnicheskiy institut) B

TITLE: Electrical conductivity of liquid and solid phase components of chromium-silicon (Cr sub 3 Si, Cr sub 5 Si sub 3, and CrSi) systems 27

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 8, 1965, 1289-1295

TOPIC TAGS: electric conductivity, chromium compound, silicide, temperature dependence

ABSTRACT: In a previous study, Baum, et al (Izv. AN SSSR, Otd. Tekh. i Metallurgiya i Gornoye Delo, No 2, (1964), p 149) reported some observations concerning the electrical conductivity (σ) of Si, Cr and silicon disilicide which were prepared by levitation melting in a rotating magnetic field at temperatures ranging from 20 to 1900°C. The present study presents the results of analogous measurements which were carried out with the lower silicides in the same temperature interval. The reasons for carrying out a similar investigation was the fact that preparations of varying purity were used previously and only data for their properties at room temperature was presented as well as the fact that the reports concerning the nature of conductivity in the lower chromium silicides are fundamentally different and, as a rule are based only on the results of low-temperature measurements.

Card 1/2 UDC: 546.76'281

L 27429-66

ACC NR: AP6017686

The present authors investigated the electrical conductivity of lower chromium silicides in temperatures ranging from room to 1900°C. It was shown that Cr_3Si and CrSi possess negative temperature coefficients all the way up to the melting point. On the other hand, Cr_5Si_3 changes type of conductivity above 600-800°C. It was discovered that liquid lower chromium silicides have a predominantly metallic nature of conductivity. Reasons for the temperature path of the electrical conductivity of these compounds in the solid state are expressed on the basis of a comparison of the distance between the Cr and Si atoms in the unit cell of the studied silicides with the sum of their metallic radii. The electrical conductivity of solid Cr_3Si drops monotonously with a rise in temperature. The temperature dependence of the electrical conductivity of Cr_5Si_3 has a complex character. Apparently some of the bonds in Cr_5Si_3 are of a covalent nature and provide for stronger interatomic reactions. It is obvious that the electrons of these bonds are excited at sufficiently high temperatures, causing a rise in the electrical conductivity and change in the sign of $d\sigma/dt$. Hence, in contradiction to Cr_3Si, Cr_5Si_3 possesses an extremal dependence of σ to t. Chromium monosilicide does not reveal an extremal relationsuip of σ and by its electrical properties occupies an intermediate position between Cr_3Si and Cr_5Si_3. The electrical conductivity of CrSi rises sharply at 1480°C and then a break is observed in the proximity of 1600°C. This is accompanied by a change in $d\sigma/dt$. These effects reflect the phase transformations in the system and are in fair agreement with the data for the measurement of the heat content in solid and liquid chromium monosilicide. The structural singularities of liquid Cr-Si alloys were also examined.

Orig. art. has: 2 formulas and 3 figures. [JPRS]

SUB CODE: 20, 07 / SUBM DATE: 01Apr65 / ORIG REF: 019 / OTH REF: 003

Card 2/2

L 02222-67 EWT(l)EWT(m)/EWP(w)/T/EWP(t)/ETI IJP(c) JD/JG/JH

ACC NR: AR6013679 SOURCE CODE: UR/0058/65/000/010/E102/E102

AUTHOR: Gel'd, P. V.; Suchil'nikov, S. I.; Baum, B. A.

TITLE: Electric conductivity of alloys of the chromium-aluminum system

SOURCE: Ref. zh. Fizika, Abs. 10E822

REF. SOURCE: Tr. Ural'skogo politekhn. in-ta, sb. 144, 1965, 134-136

TOPIC TAGS: chromium alloy, aluminum alloy, electric conductivity, intermolecular complex

ABSTRACT: The authors investigated the electric conductivity (σ) of Al-Cr alloys in the temperature interval 15 — 1850C by a contactless method in a rotating field. Depending on the composition, σ of solid and liquid alloys varies in accordance with an extremal law. The results show that the quasimolecular complexes corresponding to melts with ~ 50 at.% of Al and Cr are stable formations up to a temperature of 1750C. [Translation of abstract]

SUB CODE: 20

Card 1/1

ASTAKHOVA, L.N.; UTNITSKAYA, P.M.; LEVINA, T.A.; KURANOVA, L.K.; VODYANNIKOVA, A.A.; SUCHIL'NIKOVA, N.A.; MYL'NIKOVA, N.Ye.; LYUBOVITSKAYA, V.Z.

Separability of the poliomyelitis virus in those innoculated with live attemuated vaccine. Vop. virus 7 no.1:121 Ja-F '62. (MIRA 15:3)

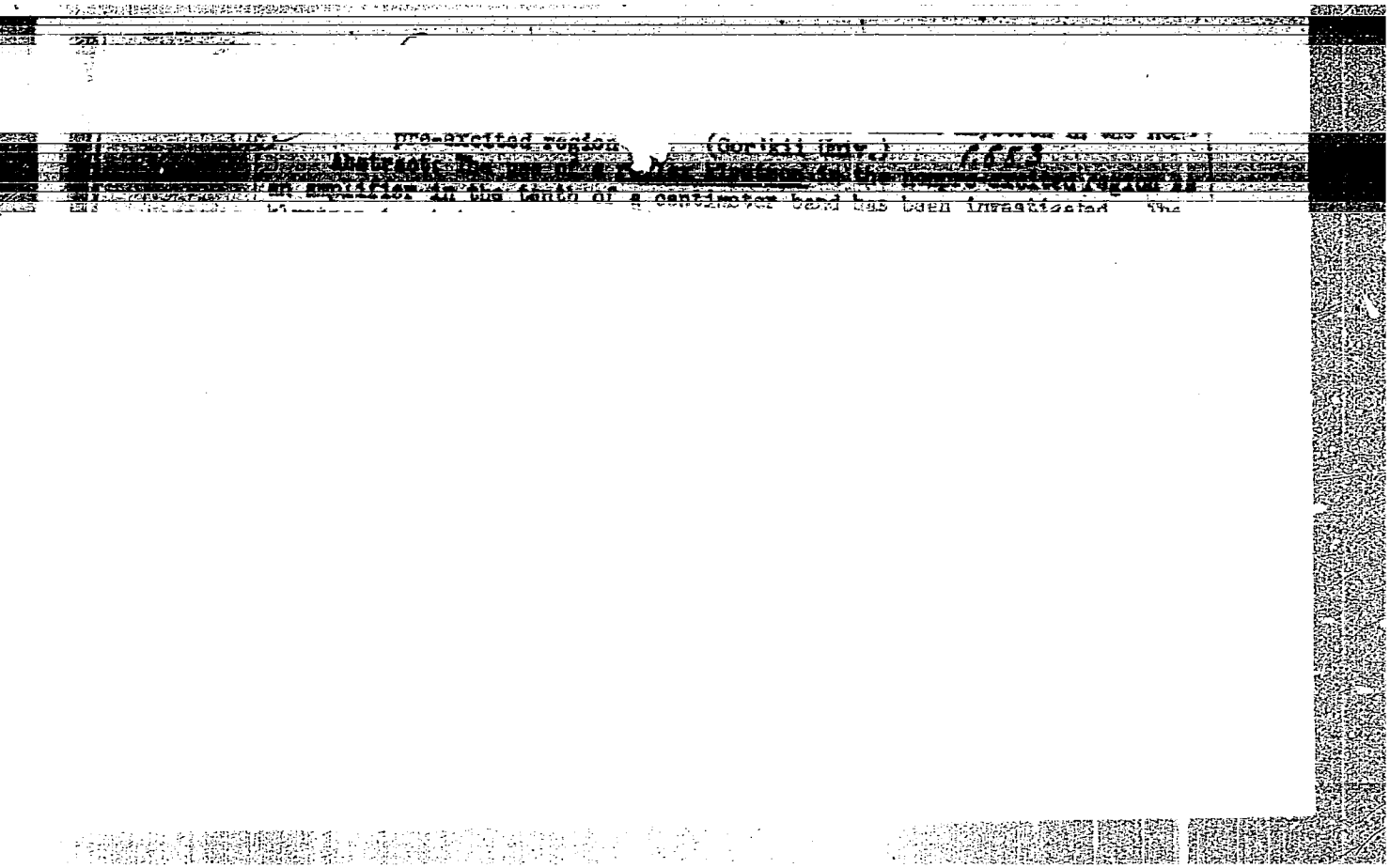
1. Sverdlovskiy institut po profilaktike poliomiyelita.
(POLIOMYELITIS VACCINE)

SUCHITSKIY, P.I.

Meteorites in the collection of the Committee on Meteorites of the Academy of Sciences of the Ukrainia S.S.R. in Kiev. Meteoritika no.12:103-105 '55. (MIRA 8:10)
(Kiev--Meteorites)

SUCHIU, Ya.Ya. [Suciu, I.I.], inzh.; [illegible], V.F. [Vesentean, V.F.], inzh.; MATIAK, I.F. [Matiac, I.F.], inzh. (Moldavskaya Narodnaya Respublika)

Study of resistances made up of steel plates for use in electric traction systems. Elektrotekhnika 35 no.7:27-31 '64. (MIRA 17:11)



SUCHKIN, G. L.

G. L. SUCHKIN, V. A. Khromov: "Thermal electromagnetic emission of a system which is not subject to the reciprocity theorem in the microwave band." Scientific Session Devoted to "Radio Day", May 1958, Trudrezervizdat, Moscow, 9 Sep. 58

The Onsager relations known in the themodynamics of irreversible processes are generalized for the case of a system which is not subject to the reciprocity theorem in symmetric and antisymmetric form.

The presence of spatial asymmetry of the intrinsic thermal emission is shown for waveguide systems containing nonreciprocal elements and an expression is found for the difference in the spectral density of the power transmitted by such an element in mutually opposite directions in terms of its parameters.

Results are presented of an experimental investigation of the above-mentioned phenomenon in a ferrite resonant isolator.

Suchkin, G.L.

SOV/142-58-4-29/30

AUTHOR: Stolyarov, A.G.

TITLE: All-Union Session Marking "Radio Day" (Vsesoyuznaya nauchnaya sessiya, posvyashchennaya "Dnyu Radio")

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy - Radiotekhnika, 1958, Nr 4, pp 517-521 (USSR)

ABSTRACT: During the period May 12-17, 1958, an All-Union Scientific Session was held in Moscow, devoted to "Radio Day". It was organized by the Scientific Technical A.S.Popov Association for Radio-Engineering and Electro-Communications. 280 papers were read at the session, 25 in the field of information theory and more than 20 in the field of electronics, dealing with theoretical/experimental research on electronic equipment. V.I.Siforov spoke on "The Transmission Capacity of Single-Ray and Multi-Ray Communication Canals". L.I.Filippov looked at the potential interference resistance of an ideal radio receiver. D.A.Novik spoke on "The Transmission System of Electric Signals by the Optimal Code of Shannon-Fano." A. Ye. Basharinov and B.S.Fleyshman discussed "The Use of the Successive Analysis Method in Equipment for Determining Weak Signals in Noise", and L.M.Fink examined "The Potential Interference Resistance in a Non-Definite Signal Phase". V.A.Kashirin and G.A.Shustova discussed "The Optimal Parameters of the Tele-measuring System with regard to Interference Resistance". B.S.Fleyshman spoke on the question of creating an optimal code - in the Shannon conception - in the case of a binary symmetrical canal. L.P.Borodin discussed "The Method of Creating Several Codes with a Simple Base". In the field of electronics, P.A.Tarasov spoke on "Broad Band Electron Ray Tubes for Observation and Recording of Electric Impulses and Ultra-High Frequencies" and V.P.Radchenko examined the question of the practical utilization of tubes with a cathode net. O.P.Semenov, V.P.Sazonov, M.N.Sbitneva and A.S.Bondarev examined: "Use of the Radiosonde with a High-Ohm Feed for Examining Electromagnetic fields in resonators and wave guides".

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... and Yu. Kitsman spoke on "The Selection of Oscillatory Energy of an Electronic Current, Modulated According to Density". M.B.Golant discussed a negative clystron with a wide range of electron adjustment. S.I.Bychkov explained the phenomenon of electron displacement and gave an approximate description of the frequency characteristics of the magnetron under conditions of high amplitude oscillations. A.I.Tereshchenko spoke on "The Influence of Various Factors on a Critical Magnetic Magnetron Field with a Grid".

... A.I.Lebedev-Karmanov spoke on "... Television Stations" and V.M.Katushkina and Z.I.[illegible] discussed "Bridge Methods of Combining the Outputs of Several Generators".

... G.Sh.Kevanishvili spoke on "The Theory of Non-Linear Oscillations in Radio Engineering". ... V.A.Khromov and G.L.Suchkin spoke on "The Electro-Magnetic Radiation in Systems not Conditioned by the Theory of Reciprocity in the Ultra-High Frequency Range".

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SUCHKIN, G. L. (NIRFI, Gor'kiy)

"The Excitation of Resonators by Dipole-Radiating Molecules".

He investigated the resonator excitation process of molecular generators and amplifiers and evaluated the relativistic effects caused by the own motion of the molecules.

report presented at the All-Union Conference on Statistical Radio Physics, Gor'kiy, 13-18 October 1958. (Izv. vyssh uchev zaved-Radiotekh., vol, 2, No. 1, pp 121-127) COMPLETE card under SIFOROV, V. I.)

06493
SOV/141-58-4-9/26

AUTHORS: Suchkin, G.L., and Tsaregradskiy, V.B.

TITLE: The Problem of Measurement of the Absorption of a Medium by its Thermal Electromagnetic Radiation in a Waveguide (K voprosu ob izmerenii pogloshcheniya sredy po yeye teplovomu elektromagnitnomu izlucheniyu v volnovode)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1958, Nr 4, pp 90-94 (USSR)

ABSTRACT: The system considered is in the form of an infinite waveguide with ideally conductive walls. A section $l>z>o$ of the waveguide is filled with an absorptive medium. The regions outside the absorptive medium are denoted by L_1^-, L_1^+, while the region inside the medium is L_2. The spectral intensity of the radiation of a non-matched radiator is expressed by the Kirchhof Law:

$$P\omega = \frac{\theta}{2\pi} \sum_n^{(1)} A_n \qquad (1)$$

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The Problem of Measurement of the Absorption of a Medium by its Thermal Electromagnetic Radiation in a Waveguide

where θ is the energy temperature of the system and A_n is the energy absorption coefficient for a wave with an index n. The complex coefficients of reflection p and transmission d for the boundary of L_2 in the waveguide can be expressed by Eq (2) where h_2 is the propagation constant of the n-th eigenwave in L_2, α is the attenuation coefficient and r_{12} is the reflection coefficient for the semi-infinite medium in the waveguide (Ref 5). From Eq (2) the energy absorption coefficient can be expressed by Eq (3) so that the attenuation coefficient is given by Eq (4). If $R = |p|^2$ and $K = |d|^2$, the relationship between K and R can be expressed by Eq (5), from which it follows that the attenuation coefficient is given by Eq (6). This relationship can be used to determine α by means of experimental measurements. For this purpose, the investigated sample is placed in a waveguide whose one end is connected to a microwatt-meter, while the other end is terminated with a matched load at a temperature $T^o = 0$. The quantity R can be

06468
SOV/141-1-5-6-12/28

AUTHORS: Suchkin, G.L. and Khromov, V.A.

TITLE: Thermal Electromagnetic Radiation of the Systems Not Obeying the Reciprocity Principle

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1958, Vol 1, Nr 5-6, pp 88 - 92 (USSR)

ABSTRACT: A system "C" which does not obey the reciprocity principle can be constructed in the form of a cylindrical waveguide with ideally conducting walls and is characterised by the absorption coefficients A_{ik}, reflection coefficients R_{ik} and transmission coefficients D_{ik} (where i, k = 1, 2). The system is illustrated in Figure 1. Further, it is assumed that the waveguide section is loaded at both ends with matched loads "H" at a temperature T. The spectral power density of the radiation of the system "C" in the two directions (Figure 1) is given by Eqs (1), where $P_{1\omega}$ and $P_{2\omega}$ are the power spectral densities, $\theta = kT$ and $\Gamma = D_{12} - D_{21}$. If the system is matched ($R_{11} = R_{22} = 0$), Eq (1) can be written in the form of Eq (2). In a general

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Thermal Electromagnetic Radiation of the Systems Not Obeying the Reciprocity Principle

Eq (5) cannot be regarded as passive, since it contains internal fluctuating voltages. It is now necessary to determine the average power dissipated across a resistance R at a temperature T^0 at one of the terminals, while the other terminal contains an impedance Z which is also at the temperature T^0 (Figure 2). The average power dissipated in R by the Fourier-components of the electromotive force E_{1f} and E_{2f} is given by Eq (8).

The expression for the average power dissipated in a reversed quadripole is similar. The difference between the powers is therefore expressed by Eq (9). Since Eq (9) is very unwieldy, only the case of a symmetrical quadripole is considered. For this case, the difference between the power spectrum densities is given by:

$$\Delta P_f = 4\theta R\alpha \left(|Z_{21}|^2 - |Z_{12}|^2\right) \mathrm{Re}(Z_{22} + Z) \qquad (10) .$$

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Thermal Electromagnetic Radiation of the Systems Not Obeying the Reciprocity Principle

to each direction of the magnetic field corresponds a particular curve. As the field is increased, the differences between the radiation temperatures in the two directions become more pronounced. The authors express their gratitude to S.M. Rytov and V.S. Troitskiy for discussion of the results. There are 3 figures and 10 references, of which 7 are Soviet and 3 English.

ASSOCIATION: Issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Radiophysics Research Institute of Gor'kiy University)

SUBMITTED: March 6, 1958

Card 5/5

AUTHOR: Suchkin, G. L. 57-28-5-36/36

TITLE: On Space Harmonics and Eigenwaves of a Periodic Wave Guide
(O prostranstvennykh garmonikakh i sobstvennykh volnakh periodicheskogo volnovoda)

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 28, Nr 5, pp. 1126-1127 (USSR)

ABSTRACT: In this letter to the editor the author comments on the paper by Vaynshteyn (Reference 1). He writes, that the separate initial assumptions concerning the determination and the properties of the eigenwaves of a periodic wave guide unfortunately are far from having any physical and mathematical basis. For this reason it is impossible to accept them in any case. It is, moreover, not difficult to give an example, which refutes the generalization of the theorem by Floke proposed by Vaynshteyn and at the same time the determination of the wave number h for the S-wave. Vaynshteyn determines the periodic structure with an isotropic ε and μ, postulating, that this is suffi-

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cient for the description of the eigenwaves of the limit--periodical system filled with a homogenous medium. It follows, however, from the demand of the invariance of the solutions of Maxwell's equations, that the continuity of the periodic boundaries is only possible by the introduction of an inhomogenous anisotropic medium. For this reason the investigation of a periodic wave guide (Reference 1) has only a meaning as a first approximation in the solution of a more complicated problem concerning an anisotropic, periodic wave guide.
There are 3 Soviet references.

SUBMITTED: January 6, 1958

1. Waveguides--Theory

USCOMM-DC-55805

SOV/142-2-1-21/22

AUTHOR: Suchkin, G.L.

TITLE: The First All-Union Conference on Statistical Radio Physics (Pervaya Vsesoyuznaya konferentsiya po statisticheskoy radiofizike)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy - radiotekhnika, 1959, Vol 2, Nr 1, pp 121-127 (USSR)

ABSTRACT: The first All-Union Conference on Statistical Radio Physics took place in Gor'kiy from 13 to 18 October 1958. The Conference was organized and conducted by the Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom gosudarstvennom universitete imeni N.I. Lobachevskogo (Scientific Research Institute of Radio Physics at the Gor'kiy State University imeni N.I. Lobachevskiy - NIRFI) by order of the USSR Ministry of Higher Eduction, AS USSR, VNTOR and E imeni A.S. Popov. A number of well-known specialists participated at the Conference, among them S.M. Rytov, M.L. Levin, I.L. Bernshteyn and others. Further, there were representatives of

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The First All-Union Conference on Statistical Radio Physics

is on a satisfactory level. Concerning the latter problem, there is a lack of scientific papers, and the number of reports dealing with this subject, was inadequate, even at this Conference. The Conference participants heard with great interest the latest research results in the field of the statistical theory of communication (theory of information) contained in the report "The Theory of Radio Communication Channels Having Parameters Changing at Random" by V.I. Siforov, Associate of AS USSR, which was delivered at the plenary session. I.L. Bernshteyn (NIRFI, Gor'kiy) reviewed the development of statistical radio physics in his report, titled "Fluctuation Phenomena in Self-Oscillator Networks". Already in the mid-thirties, by suggestion and under supervision of A.A. Andronov, the author analyzed and calculated processes in an ordinary vacuum tube oscillator, considering the fluctuation influence of the shot effect in the tube and the thermal effect in the network. Later,

two semiplanes which are infinitely straight. Using the point transformation method, small fluctuations investigated in the neighborhood of a stable limit cycle. The statistical characteristic and the diffusion coefficient of the "phase" were obtained. Disregarding the "amplitude" fluctuation, the self-oscillation spectrum was obtained. The author showed that the width of the lines at half the intensity level is propertional to the square of the harmonic number, and also their integral intensity, which is also the case during the absence of fluctuations. As an example, the author discussed a tube oscillator with an anode network and inductive feedback. The work of the three conference sections was conducted from 14 to 17 October 1958. The section "Fluctuations in Self-Oscillator, Radio Measuring and Amplifier Networks" was headed by I.L. Bernshteyn and S.M. Rytov. A.N. Malakhov (NIRFI, Gor'kiy) delivered a report on "The Spectral Line Width of Oscillators and the Parameter Fluctuation".

were found for the non-linear case. A great number of reports dealt with the investigation of slow fluctuations. V.S. Troitskiy (NIRFI, Gor'kiy) delivered a report on "The Spectral Width of Tube Oscillator Lines and Flicker Noise". He explains a method for calculating the influence of slow fluctuations on the frequency and amplitude of self-oscillator oscillations. The author showed that tube flicker noise may influence the amplitude and frequency fluctuation of the oscillations, whereby the line contour appears in the Doppler shape, while its width exceeds the natural line width by some orders. Yu.A. Dryagin (NIRFI, Gor'kiy), "An Investigation of Technical Frequency Drifts of Tube Oscillators", explained a measuring method and presented measuring results obtained with oscillators in the range of 20-200 mc. He showed experimentally that the spectral density of the frequency changes as 1/f. He suggested an oscillator circuit providing a greater frequency stability than the conven-

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Frequency Radio Pulse Oscillator With a Reflex Klystron", They investigated the fluctuation effects, appearing as settling time fluctuations of the stationary amplitude and phase and as phase and amplitude fluctuations during a radio pulse. The author presented the results of theoretical and experimental investigations. The report of S.A. Akhmanov "Slow Frequency and Amplitude Fluctuations in a Reflex Klystron", dealt with a method and the results of an experimental investigation of spectral densities of frequency and amplitude fluctuations in a 3-cm wave reflex klystron within the range of 100 cps to 5 kc. The author showed that the spectral density of the klystron frequency fluctuations changed within the indicated range as 1/f, when all electrodes were fed from batteries, and that the phase dispersion during the time of 10^{-3}-10^{-4} seconds was principally determined by slow fluctuations. Ye.N. Bazarov and M.Ye. Zhabotinskiy (IREAN, Moscow), "Fluctuations in a

of the noise behaviour in electron flows. Two reports were devoted to statistical electrodynamics. The report of V.I. Bespalov (NIRFI, Gor'kiy) "Some Problems of the Wave Propagation in Random Heterogeneous Transmission Lines" dealt with discrete and continuous random heterogeneities. Further, the correlation of the reflection factor, caused by heterogeneities during the propagation of waves with different frequencies, was discussed. V.I. Talanov and N.M. Sheronova (GGU, Gor'kiy) reported on "The Influence of Random Errors in the Source Distribution on the Radiation Pattern of Traveling Wave Antennas". The author showed that, in case of continuous and also in case of discrete radiation element distribution, phase speed deviations of a wave at an antenna, limit the maximum possible gain of the latter when increasing its length. For the second case, current correlation functions in radiators were found, with consideration of their mutual influences, caused by the principal wave in

V.F. Nesteruk (LKU, Leningrad), caused serious objections of the conference participants.
The conference members heard with great interest the report "Optimal Non-Linear Receiver Networks Performing the Separation of the Signal from the Noise" by R.L. Stratonovich; the contents of this report is closely related with the theory of information. K.A. Goronina and A.A. Grachev (NIRFI, Gor'kiy) reported on "Fluctuations During Magnetic Polarity Reversal of Ferromagnetic Materials". The author calculated the spectral densities of noises and remaining fluctuating even harmonics, appearing during periodical polarity reversal of ferromagnetic materials. The contents of the report may be used for an evaluation of the ultimate sensitivity of magnetic amplifiers. A comparatively small number of reports was delivered on noise physics. F.G. Bass and M.I. Kaganov (IREUN, Khar'kov) reported on the "Correlation Ratios for Random Electron Currents and Fields at Low Temperatures".

processes (known in thermodynamics) of the Onsager-Kasimir reciprocity relationships. The latter fact permits a generalization of the Kirchhoff waveguide law. It was first obtained by S.M. Rytov for unbalanced, independent systems, subjected to the thermodynamics of nonreversible processes. Rytov expressed this in the following form: The own thermal electromagnetic radiation intensity of a semi-transparent, symmetric radiator, - which is not subjected to the reciprocity theorem, neither in the symmetric, nor in the antisymmetric form - , is determined by the absorption in the radiation direction. F.V. Bunkin (FIAN, Moscow) reported on "The Barkhausen Effect in an Alternating Field. The section "Wave Propagation in Statistically Heterogeneous Mediums" was headed by N.G. Denisov (NIRFI, Gor'kiy) and V.I. Tatarskiy (AS USSR, Moscow). N.G. Denisov and V.A. Zverev (NIRFI, Gor'kiy) presented a review under the title: "The Wave Propagation in Mediums With Random Heterogeneities"

Scattering of Radio Waves by the Lower Ionosphere", reported on an interesting theoretical and experimental investigation of the radio wave back scattering in irregular heterogeneities of the ionosphere. V.I. Tatarskiy (AS USSR, Moscow) reported on "Wave Scattering by Random Heterogeneities of the Refraction Index in the Fresnel Diffraction Approximation". The section "Statistical Phenomena in Quantum Amplifiers, Generators and Spectroscops" was headed by L.L. Myasnikov and Docent V.S. Troitskiy. The reports delivered in this section dealt chiefly with problems of investigating and using quantum-mechanical amplifier and generator systems. The report of N.V. Karlov and B.M. Chikhachev (FIAN Moscow), "The Sensitivity of Radiometers in the Quantum Range", dealt with an analysis of the ultimate accuracy of measuring the effective noise temperature at the radiometer input when the condition $h\omega \approx kT$ was satisfied. The optimum noise temperature was found, at which the sensitivity of a

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radiometer is best. The results obtained by this way, were used for calculating the sensitivity of a radiometer by the antenna temperature. The author further considered the sensitivity of a radiotelescope when measuring the effective temperature of cosmic radio radiation sources. They showed that the sensitivity of radiotelescopes is essentially determined by the quantum effects, even outside the quantum range at $h\omega < kT$. The theory of quantum amplifiers working on an ammonia molecule beam was explained in the report of V.S. Troitskiy and V. B. Tsaregradskiy (NIIRFI, Gor'kiy), titled "The Sensitivity of Amplifiers Working on a Beam of Excited Molecules". The authors showed that the influence of thermal network noise on the receiver sensitivity may be changed by parameters subject to selection, but the spontaneous molecule radiation noise increases in this case. At room temperature and optimum parameters, the interior noise of such an amplifier will amount to about 8° Kelvin. V.S.

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V.V. Volkov, L.L. Myasnikov, A.I. Naumov and V.V. Stroganov (NIRFI, Gor'kiy) presented calculations of an atom-beam radiospectroscope, using magnetic resonance on cesium atoms, in their report, "Methods of Atom-Beam Radiospectroscopy". I.L. Bernshteyn and Yu.A. Dryagin (NIRFI, Gor'kiy) reported on "The Application of a Molecular Generator as a Stable Frequency Reference Signal for Phase Automatic Frequency Control of a High-Power Generator". They describe an experimental unit operating in such a way that the eighth harmonic of the klystron oscillations coinincides with the oscillation of the molecular generator. The relative frequency stability of the output signal is in this case equal to the relative molecular generator stability. The following reports were remarkable: "An Autodyne Radiospectroscope in the 3-cm Wave Range" by S.A. Akhmanov, S.D. Gvozdover, Yu.S. Konstantinov and I.T. Trofimenko (MGU, Moscow); "The Development of Equipment for Investigating Molecular and

SUCHKIN, G.L.

Possibility of observing the complex spectral composition of a moving radiation source in a media with negative absolute temperature. Izv. vys. uchab. zav.; radiofiz. 5 no.4:815-816 '62. (MIRA 16:7)

1. Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete.
(Doppler effect) (Radio)

SUCHKIN, G.L.; RAKOVA, G.K.

Excitation of the E_{olo} mode in the cylindrical cavities of masers. Radiotekh. i elektron 7 no.7:1251-1252 '62. (MIRA 15:6)
(Microwaves) (Masers) (Electric resonators)

AUTHOR: Barsukov, K. A.; Suchkin, G. L.

TITLE: Radiation-line width in a complex Doppler effect

SOURCE: IVUZ. Radiofizika, v. 6, no. 3, 1963, 449-456

TOPIC TAGS: Doppler effect, radiation line, radiation-line width

ABSTRACT: When a source of electromagnetic waves travels in a dispersing medium, the radiation spectral line can split along a fixed direction. Conditions of resolvability of broadened spectral lines are theoretically investigated, as well as the effect of finite duration of the radiation source and the effect of absorption. It is shown that the above conditions can be reduced to the well-known conditions of complex spectral composition of half-intensity radiation. Resolvability conditions for a loss-free medium are considered in detail, as well as the peculiarities of spectrum in a low-loss case. It is found that, under certain conditions, the

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ACCESSION NR: AP3004830

observable line width is practically independent of the duration of radiation and is entirely determined by the characteristics of the dispersing medium. The results were obtained for the purpose of evaluating the observation of complex Doppler radiation at thermal velocities for very narrow spectral lines. "In conclusion, we are using this opportunity to thank I. M. Frank for his constant attention to the subjects in question." Orig. art. has: 1 figure and 25 formulas.

ASSOCIATION: Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Scientific-Research Radiophysics Institute, Gor'kiy University)

SUBMITTED: 010ct62 DATE ACQ: 27Aug63 ENCL: 00

SUB CODE: PH NO REF SOV: 004 OTHER: 000

APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653720010-6"

ACCESSION NR: AP[illegible]

[illegible]/035/007/1280/1287
539.107.44

AUTHOR: Suchkin, G. Ye.

TITLE: On a resonance counter of particles

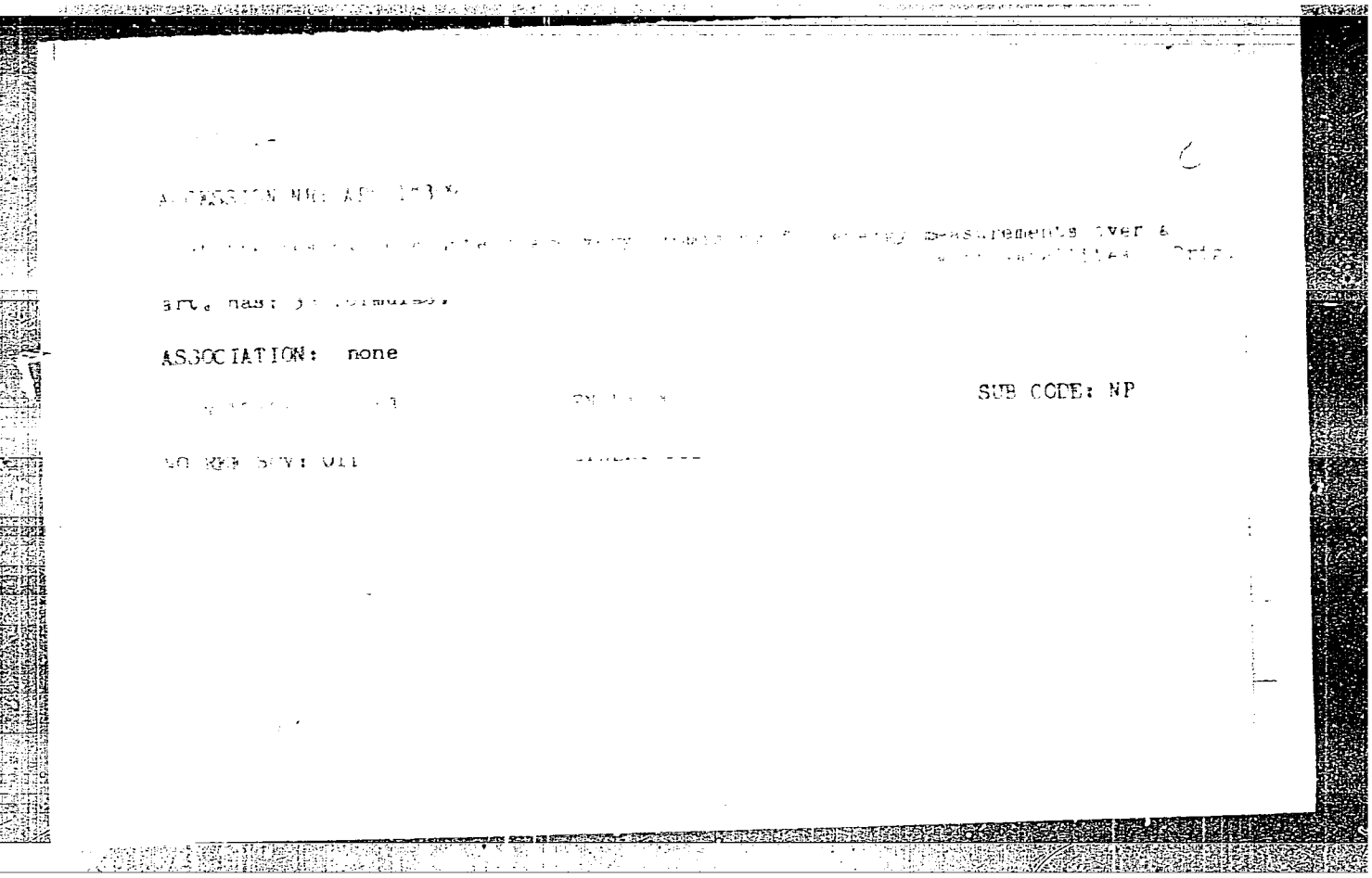
SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 7, 1965, 1280-1287

TOPIC TAGS: particle counter, velocity measuring instrument, maser, charged particle

ABSTRACT: The author has proposed a particle counter consisting of a resonator filled with material at a negative temperature which would amplify by maser action the passage of a charged particle;

[illegible] the working substance, [illegible] accuracy of [illegible] be". [illegible] gas counters the advantages [illegible]

Card 1/2



ASSOCIATION: none

SUB CODE: NP

523.32

31
B

AUTHOR: Matveyev, Yu. G.; Suchkin, G. L.; Troitskiy, V. S.

probably depends on wavelength. This dependence and the difference
of $\gamma = (k\rho c)^{-1/2}$, determined from measured differences in the moon's surface tem-
perature during an eclipse and change in phase, are shown to be caused by an increase

coefficient of reflection with an exponential
nonhomogeneous layer, for two different density values and varying thickness. The
factor $\alpha = k/\rho$, which characterizes the microstructure of lunite, was also computed
and found to be approximately $2 \cdot 10^{-5}$; i.e., within the range of values characteris-

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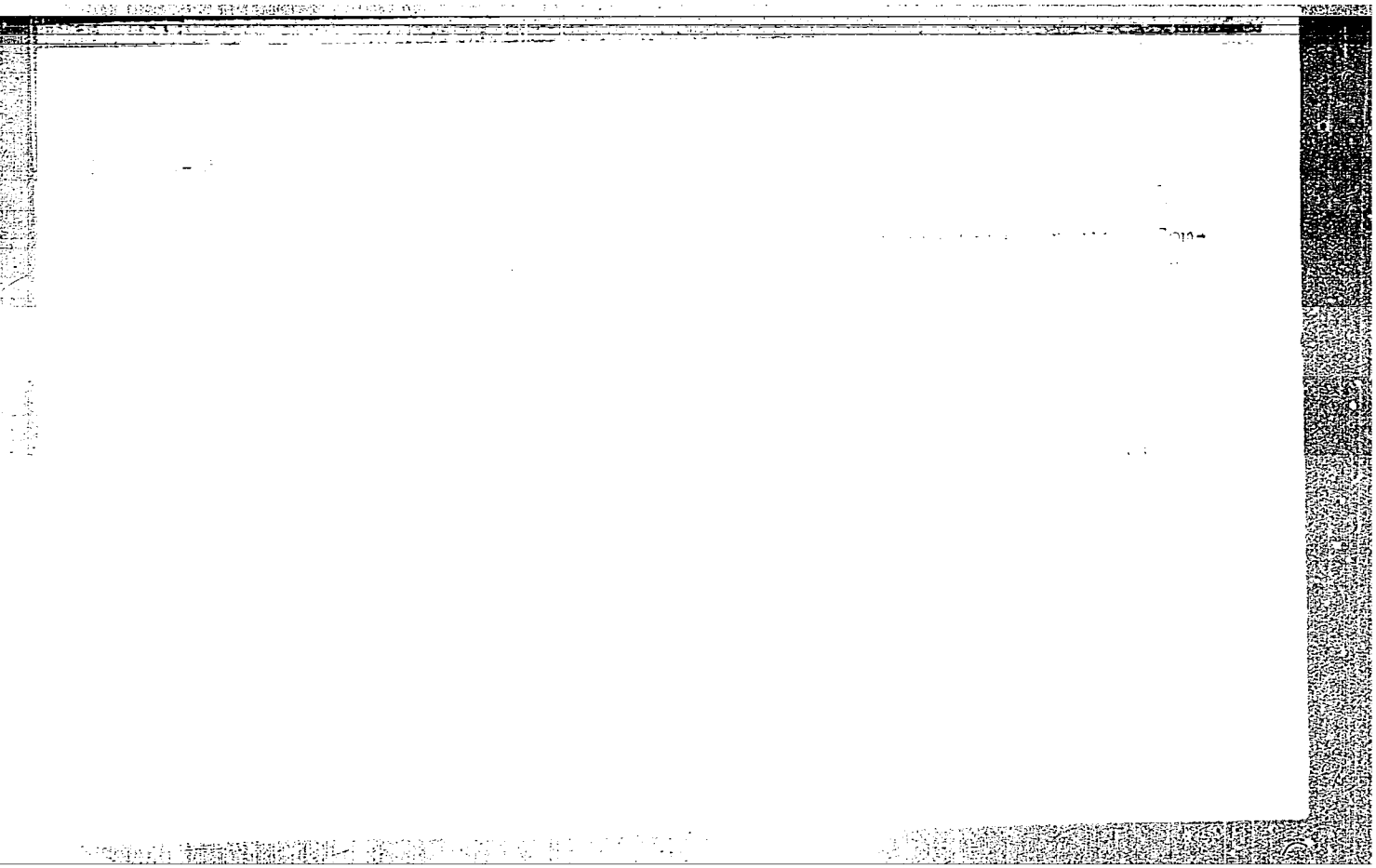

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ACC NR: AP6007502 SOURCE CODE: UR/0109/66/011/002/0256/0266

AUTHOR: Suchkin, G. L.

H2
B

ORG: none

TITLE: Some peculiarities of the "moleculochron"

SOURCE: Radiotekhnika i elektronika, v. 11, no. 2, 1966, 256-266

TOPIC TAGS: maser, molecular beam, radio spectroscope

ABSTRACT: A special high-stability maser, "moleculochron" (MC), is considered in which a new principle is used for increasing the effective time of molecular-beam interaction (Author's Certificate 155240 of 20 June 60, "Bull. izobr.", 1963, 12, 32). A comparison between the conventional single-resonator maser and the MC permits noting the following peculiarities of the latter: (1) Self-excitation of the MC under small-signal and small-detuning conditions depends on the delay; limits of oscillation zones are indicated; (2) The self-excitation region in the MC is interspersed with bands where no stationary conditions exist; (3) Monochromatic stationary oscillations can arise only in the first region; a frequency formula is given; (4) The maximum

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cycle strength in the MC can exceed that of the conventional maser; (5) The MC maximum stability is limited by a nonmonochromatic oscillation range; (6) An under-excited MC permits extending the Ramsey method over the active-molecule beams; such an MC operated as a radiospectroscope conceivably has certain advantages over conventional systems. Orig. art. has: 5 figures and 23 formulas. [03]

SUB CODE: 20, 09 / SUBM DATE: 14Oct64 / ORIG REF: 010 / OTH REF: 006
ATD PRESS: 4222

Card 2/2

SUCHKO, Georgiy Dmitriyevich, inzh.; YEVGRASHIN, Konstantin Fedorovich, inzh.; KREMKOV, Gennadiy Dmitriyevich, inzh.; KUDIKINA, Ye., red.; NIKITINA, V., tekhn. red.

[Trawls and drift nets; a manual for workers of fishing equipment factories and for master fishermen] Traly i drifternye seti; posobie dlia rabochikh fabrik orudii lova, masterov dobychi. Kaliningrad, Kaliningradskoe knizhnoe izd-vo, 1963. 109 p. (MIRA 17:3)

1. Kaliningradskaya fabrika orudiy lova (for Suchko, Yevgrashin, Kremkov).

ZANNES, A.N., inzh.; RUDOL'SKIY, N.L., inzh.; FRADIN, M.D., inzh.; SAPELKINA, O.R., inzh.; BIKHUNOV, L.Ya., inzh.; GLOZMAN, M.I., inzh.; Prinimali uchastiye: DEMICHEV, A.D.; SUCHKOUSOV, V.P.; BLAGOVESHCHENSKIY, G.V.; GOLOVIN, G.F.; KAZARNOVSKIY, D.S.; RAVITSKAYA, T.M.

Surface induction hardening of rails along their whole length at the Azovstal' Plant. Stal' 24 no.8:731-734 Ag '64. (MIRA 17:9)

1. Nauchno-issledovatel'skiy institut tokov vysokoy chastoty (for Demichev, Suchkousov, Blagoveshchenskiy, Golovin). 2. Ukrainskiy nauchno-issledovatel'skiy institut metallov (for Kazarnovskiy, Ravitskaya).

ANTONOV, B., inzh.; GATEV, G., inzh.; SUCHKOV, Al., inzh.

Possibilities of manufacturing drills with plastic conic shafts. Mashinostroene 13 no.12:34-36 D '64.

1. Higher Institute for the Mechanization and Electrification of Agriculture, Ruse.

TURUSOVA, Z.M., assistent; ISAKOV, A.M., inzhener; SUCHKOV, A.A., inzhener-ekonomist.

Experience in organizing rhythmic work according to a daily chart in a celluloid plant. Trudy LIEI no.9:5-19 '55.

(MLRA 9:9)

(Celluloid) (Efficiency, Industrial)

SOV/136-59-6-10/24

AUTHORS: Suchkov, A.B., Borok, B.A., Yermakova, T.N., Rodnyy, M.I. and Boldina, L.D.

TITLE: On the Production of Titanium by Electrolysis of Molten Salts, Using Soluble Anodes (Nekotoryye voprosy polucheniya titana elektrolizom rasplavlennykh sred s ispol'zovaniyem rastvorimykh anodov)

PERIODICAL: Tsvetnyye metally, 1959, Nr 6, pp 57-62 (USSR)

ABSTRACT: Any titanium compound possessing electronic conductivity can be used as soluble anode. The authors used titanium nitrides and carbides and hydrogen-containing, oxygenous and inter-metallic compounds of titanium, as well as titanium-base alloys for their experiments. These were carried out in a large laboratory plant with a maximum current supply of 1000 A. The electrolysis cell is shown diagrammatically in the figure, p 57 (1 - bath; 2 - lid; 3 - cell; 4 - anode lead; 5 - cathode lead; 6 - syphon). The entire apparatus was made of stainless steel. Compact anodes, made by powder metallurgical methods were used. These were fixed into position and connected up and a mixture of dry NaCl and KCl (1:1) was charged into the bath.

On the Production of Titanium by Electrolysis of Molten Salts By Using Soluble Anodes

Any residual moisture and occluded gases were removed by melting. A second (electrolytic) purification was carried out, in the course of which the electrolyte was saturated with titanium by means of an auxiliary cathode, and then electrolysis with a working cathode was carried out. All operations were carried out in a stream of dry, purified argon. All the experiments were performed at a temperature of 760°C and in each case the quantity of electricity was the same (1500 A hours). The following were analyzed: the cathode powder obtained on working with the auxiliary cathode; three layers of the cathode deposit (internal, middle and outer); three layers of anode slime; the electrolyte and the removed products. The results of experiments with Ti-Fe, Ti-Al, Ti-Si and Ti-Nb alloys are shown in Table 1. At present the authors are engaged on the study of binary alloys of Ti and Ni, Ca and similar metals, and Mn. Preliminary

 experiments have shown that the behaviour of Ni is

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analogous to that of Fe; Ca and like metals dissolve off the anode preferentially to titanium but are not deposited at the cathode. If Mn is present in the anode, the latter is soluble only if its oxygen content is extremely small. Dean's findings regarding the sharp drop in the solubility of titanium in the presence of oxygen have been confirmed. The results obtained for anode material containing 0.3% O_2 are shown in Table 2. Preliminary experiments with multi-constituent alloys have led to the conclusion that most metals change the anodic solution process of titanium, as known for binary alloys, very little. This should enable electrolytic refining of preliminarily reduced titanium raw materials (slag and concentrates) to be used as a general method for producing titanium. In order to verify this assumption, the authors carried out a series of experiments using calcium hydride as reducing agent. The experiments were carried out in an apparatus consisting of a cylinder containing argon, and a container and lid made from stainless steel. The sinter

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obtained as the result of reduction was rapidly broken up and treated in a mixer, first with water, then with 1% HCl solution until the CaO had fully dissolved. The pulp was filtered off and the powder washed with water and alcohol, and after drying was studied chemically and metallographically. In the experiments the basic following parameters were varied: temperature, proportion of reagents, duration and fineness of mixture. It was found that reduction proceeds satisfactorily when the mixture is ground to a fineness of 0.147 mm or less. The optimum processing conditions are (a) for slag - 1100°C, 2 hours, 1.8 - 2.0 kg CaH_2/kg Ti; (b) for concentrates - 1200°C, 2 hours, 2.2 - 2.4 kg CaH_2/kg Ti. Thereby, 85 to 95% Ti contained in the original materials is extracted as a solid solution (see Table 4). The material thus obtained was compacted into anodes and electrolytically refined. The results of such refining of slag and concentrates are identical and are shown in Table 5. There are 5 tables and 1 figure.

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S/598/61/000/006/024/034
D245/D303

AUTHORS: Suchkov, A.B., Borok, B.A., and Yermakova, T.N.

TITLE: Electro-refining of titanium-based alloys

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Titan i yego splavy. no. 6, 1961. Metallotermiya i elektrokhimiya titana, 180 - 184

TEXT: Electrolytic refining of Ti alloys to yield pure Ti was studied in experiments carried out by the authors in a steel reactor at 800 - 950°C, the alloy filings being pulverized to a size of 10 - 20 mm and refined in batches of 1 1/2 - 2 kg. A direct relation between the purity of refined Ti and anode current density was observed. Using a Ti - 5 % Al alloy, the Al content in the cathode deposit was less than 0.05 % for a current density of 0.1 amp/cm^2 as compared with 1.50 % for 0.4 amp/cm^2 and 2.80 % for 1.2 amp/cm^2. Separation of Ti from V proved more difficult and could no be accomplished in a single electrolysis. In all alloy types studied the O, N and C contents were reduced to 0.06, 0.015 and 0.015 % respectively. There are 1 figure and 2 tables.

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ACCESSION NR: AP4009843 S/0149/63/000/006/0096/0102

AUTHORS: Meyerson, G. A.; Suchkov, A. B.; Olesov, Yu. G.; Yermakova, T. N.

TITLE: Investigation of the conditions for obtaining the lowest chlorides of titanium and zirconium

SOURCE: IVUZ. Tsvetnaya metallurgiya, no. 6, 1963, 96-102

TOPIC TAGS: titanium chloride, zirconium chloride, electrolytic refining, titanium refining, zirconium refining

ABSTRACT: Two methods for obtaining the lowest chlorides of titanium and zirconium for electrorefining were investigated: a) displacement of the iron by Ti or Zr in the solution NaCl + $FeCl_2$ forming the low chlorides; b) anode dissolving of Zr in the same solution. In the first method Ti or Zr powder (with traces of Si, Fe, Al, and Ca) was added to a mixture of NaCl and $FeCl_2$ (at 850C), held at this temperature for some time, and quickly chilled. The Ti and Zr contents were then determined. It was found that after 30 minutes at 850C the Ti content in the solution was 5.56%. In the second method bricks of Zr powder were used as the anode material and 100 amp-hrs of electricity were passed through the solution (at 850C). The deposits on the cathode were tested for Zr content. It was found

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that the yield of the lower Zr chlorides was 43.7% at a cathode current of 4.5 amp/cm^2 (for a pure NaCl electrolyte). Addition of $FeCl_2$ to the electrolyte raised the yield to 86.9% at the same current. Orig. art. has: 7 tables and 2 figures.

ASSOCIATION: Moskovskiy institut stali i splavov. Kafedra metallurgii redkikh metallov i metallokeramiki (Moscow Institute of Steel and Alloys, Department of Rare Metals and Metalloceramics)

SUBMITTED: 06Jun63

SUB CODE: GC

DATE ACQ: 07Feb64

NO REF SOV: 008

ENCL: 00

OTHER: 009

Card 2/2

L 3358-66 EWT(m)/EWP(w)/EWP(i)/EPF(n)-2/T/EWP(t)/EWP(b) IJP(c) JL/WW/JG

ACC NR: AP5025604

UR/0129/65/000/010/0056/0057
669.295.621.9-419

AUTHOR: Suchkov, A. B.; Tubyshkina, Z. A.; Sokolova, Z. I.

TITLE: Certain properties of titanium coatings

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 10, 1965, 56-57, and bottom half of insert facing p. 41

TOPIC TAGS: metal coating, titanium, electrolytic deposition, corrosion resistance, protective coating

ABSTRACT: In view of the high cost of titanium, this lightweight and corrosion-resistant metal can be most economically used in the form of coatings, chiefly on steels. Quality Ti coatings can be obtained only through the electrolysis of fused chloride and fluoride-chloride media. The Ti from these electrolytes settles in the form of a compact fine-crystalline residue and gets uniformly distributed over the cathode surface. The coating thickness depends on the cathode current density. A cathode current density exceeding 0.9-1 a/cm^2 leads to the formation of coarse crystals, sludge and slag crusts on the cathode. The electrolysis may be as long as 60 min; any longer electrolysis leads to growth of the diffusion layer rather than of the coating itself. The porosity of the coating is a function of its thickness. Pore-free coatings are obtained when the case thickness is 50 μ and higher. If Ti

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ACC NR: AP5025604

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is deposited in successive layers overlapping the pores, porosity is completely eliminated and the coating is of higher quality and thicker. The hardness of the coating depends on the composition of the base metal: the higher the carbon content of the steel, the higher the hardness of the coating is. It may be that the increase in hardness is due to the formation of titanium carbides. Bending tests showed that the coating is firmly bonded to the base, does not flake, and is destroyed only together with the base metal. Titanized specimens subjected to preliminary corrosion tests in HNO_3 and 10% H_2SO_4 retained their integrity for several hours. The investigation established that the elctrolysis of fused media may produce compact Ti coatings 100-120 μ thick and firmly bonded to the base metal. In this way, promising vistas are opened for the broad application of Ti in the chemical, shipbuilding and other industries. Orig. art. has: 4 figures.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: MM, GC

NO REF SOV: 000 OTHER: 000

Card 2/2 D.P

L 2850-66 EWT(m)/EWP(t)/EWP(k)/EWP(b)/EWA(c) LJP(c) JD/HW

ACCESSION NR: AT5022889 UR/2776/65/000/043/0060/0068

AUTHOR: Malin, A. P.; Khromov, V. G.; Tikhonov, G. F.; Suchkov, A. B.

TITLE: Production of high-purity sheets and strips by means of the direct rolling of electrolytic titanium powder

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Sbornik trudov, no. 43, 1965. Poroshkovaya metallurgiya (Powder metallurgy), 60-68

TOPIC TAGS: titanium, metal powder, metal rolling, rolling mill, cold rolling, annealing

ABSTRACT: The authors present the results of an experimental investigation of the direct rolling of the powder of electrolytically refined titanium at a laboratory rolling mill in the Gor'kiy Polytechnic Institute (roll diameters, 180 and 350 mm, roll-barrel length, 150-330 mm; RPM, 1-8) and at an industrial-type rolling mill in the TsNIIChM (Central Scientific Research Institute of Ferrous Metallurgy) (roll diameters, 600 and 900 mm; barrel length, 630 mm; RPM, 1.25 to 4.7). Four batches of powdered titanium were used: 1) screened coarse fraction,

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ACCESSION NR: AT5022889

1.6 + 1.0 mm; 2) mixture of fractions to 1.6 mm; 3) screened medium fraction, 1.0 + 0.63 mm; 4) screened fine fraction, 0.4 + 0.315 mm. Quality strip could be rolled from the coarse-grained powder (fractions 1.6 + 1.0 mm) only in the mill with rolls of a diameter of at least 600 mm, which is in agreement with the theory that strip thickness is directly proportional to roll diameter. In experiments with the further processing of strip the best results were produced by the variant with 20% deformation, which involves a large number of sinterings in an argon atmosphere, which serves to eliminate H_2, Mg, and other impurities. Strip rolled from electrolytic titanium displays high plastic properties which make it amenable to final processing by means of cold deformation (e.g. deep drawing). The techniques thus developed dispense with the need for hot working (and hence also for cold working and pickling of sheets) and reduce the percentage of wastes to 10% of the weight of raw powder used. The following industrial sequence of operations can thus be recommended: 1. Screening of powder. Use of the fraction 1.6 + 1.0 mm for rolling; 2. Rolling of 7 mm thick, 600 mm wide strip in TsNIIChM mill with roll diameters 600/900 mm; 3. Cutting of strip into sections measuring 120x350 mm; 4. Processing of strip by means of 6 cycles "sintering in argon (1200°C, 3 hr) - cold rolling," with roughing after each cycle until strip thickness is reduced to 1.4-0.8 mm; 5. Vacuum annealing of 0.8 mm thick

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at 900°C for 2 hr; 6. Cold rolling to 0.4 mm (6 passes); 7. Vacuum annealing at 700°C for 2 hr (in coil); 8. Cold rolling to 0.2 mm; 9. Vacuum annealing at 700°C for 2 hr (in coil); 10. Cold rolling to 0.1 mm; 11. Vacuum annealing at 700°C for 2 hr (in coil); 12. Cold rolling to 0.05 mm; 13. Vacuum annealing at 700°C for 2 hr (in coil). The thus obtained strip has a polyhedral structure. Orig. art. has: 6 figures, 3 tables.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: MM.

NO REF SOV: 007 OTHER: 001

Pure metal

BVK

Card 3/3

L 27864-66 EWA(k)/FBD/EWT(1)/EEC(k)-2/T/EWP(k)/EWA(m)-2/EWA(h) SCTB/IJP(c)
ACC NR: AP6000207 WG SOURCE CODE: UR/0056/65/049/005/1495/1503

AUTHOR: Suchkov, A. F.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences, SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Effect of inhomogeneities on the operating mode of solid-state lasers

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 5, 1965, 1495-1503

TOPIC TAGS: solid state laser, laser optics, laser beam

ABSTRACT: In view of the strong influence of inhomogeneities on the energy distribution in solid-state lasers and on the beam divergence, the author has investigated theoretically various factors that affect the uniformity of energy distribution in the laser. A system of two equations was derived in the geometrical optics approximation for the electromagnetic field and the population inversion, describing the nonstationary processes occurring in lasers in the presence of inhomogeneities of the complex dielectric constant in a direction perpendicular to the resonator axis. It is assumed that the active medium is homogeneous in the axial direction. It is also assumed that the imaginary part of the dielectric constant is determined by the population of the levels between which the laser action occurs. The equations are derived by solving the appropriate Maxwell's and energy-balance equations. The conditions under which the field can be represented as a superposition of the natural

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ACC NR: AP6000207

modes of a cavity resonator are determined. The equations obtained are used to calculate the operating conditions of a laser with a thin active rod along the axis. It is shown that operation in an undamped relaxation-oscillation mode is possible. Author thanks M. D. Galanin and A. M. Leontovich for continuous interest and a useful discussion, and the members of the seminar of the laboratory of quantum radiophysics and its leader, N. G. Basov, for a discussion. Orig. art. has: 3 figures and 37 formulas.

[02]

SUB CODE: 20/ SUBM DATE: 26May65/ ORIG REF: 003/ OTH REF: 001/
ATD PRESS: 4162

Card 2/2

L 27723-66 EWT(1)/EEC(k)-2/T/EWP(k)/EWA(h) IJP(c) WG

ACC NR: AP6014055 SOURCE CODE: UR/0056/66/050/004/1148/1155

AUTHOR: Letokhov, V. S.; Suchkov, A. F.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Generation dynamics of a giant coherent light pulse

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 4, 1966, 1148-1155

TOPIC TAGS: laser emission coherence, laser pulsation, laser theory, nonlinear effect, light pulse

ABSTRACT: A method developed by one of the authors (Suchkov, ZhETF v. 49, 1495, 1965) for the investigation of nonlinear nonstationary interaction of many modes in the presence of an inhomogeneous population inversion in the case of passive Q-switching laser processes in solids is employed in the present paper to study the space-time evolution of a giant light pulse from a Q-switched laser.[25] The calculation takes into account the essentially nonlinear and nonstationary interaction of many modes in the resonator of such a laser. It is shown by solving the space-time differential equations for the electric field in the resonator under the appropriate boundary and initial conditions that the observed giant pulse is the result of a superposition of a series of closely spaced pulses generated by neighboring regions in the laser. The influence of the inhomogeneous distribution of the population in-

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ACC NR: AP6014055

0

version density on the giant pulse structure is also investigated, and it is shown that the inhomogeneity of the distribution can greatly affect the waveform of the giant pulse. It is suggested that this inhomogeneity may be the cause of the second maximum observed in giant pulses by R. W. Hellwarth (Quantum Electronics, Proc. III Intern. Congress, Paris, 1964, v. 2, p. 1303). Orig. art. has: 5 figures and 12 formulas. [02]

SUB CODE: 20/ SUBM DATE: 20Nov65/ ORIG REF: 007/ OTH REF: 009/
ATD PRESS: 5001

Card 2/2 BLG

SUCHKOV, A. I.

Suchkov, A. I. -- "An Investigation of the Magnetic Properties of Nickel-Zinc and Copper-Zinc Ferrites." Cand Phys-Math Sci, Moscow State U, Moscow 1953. (Referativnyy Zhurnal--Fizika, Jan 54)

SO: [illegible] 1[illegible], 22 July 1954

USSR/Physics-Ni-Zh ferrites, properties of FD-1220

Card 1/1 Pub. 153-4/22

Author : Suchkov, A. I.

Title : Temperature dependence of magnetic properties of nickel-zinc and copper-zinc ferrites

Periodical : Zhur, tekh. fiz., 24, 1579-1583, Sep 1954

Abstract : Basic magnetic characteristics of a series of ferrites were tested by analyzing their dependence on temperature. It was found that the temperature dependence of magnetic properties of ferrites and of metallic ferromagnetics is governed by the same law. Indebted to active member of Acad. Sci. of Belorussian SSR, Prof. N. S. Akulov. Five references.

Institution :

Submitted : April 4, 1953

Suchkov, A.I.

112-1-96

Translation from: Referativnyy Zhurnal, Elektrotekhnika, 1957, Nr 1, p. 11 (USSR)

AUTHOR: Suchkov, A.I.

TITLE: Magnetic Properties of Nickel-Zinc and Copper-Zinc Ferrites in Weak Fields (Magnitnyye svoystva nikel'-tsinkovykh i medno-tsinkovykh ferritov v slabykh polyakh)

PERIODICAL: Sbornik nauch.-issled. rabot, Ivanovsk. tekstil'n. in-t, 1955, Nr 7, pp.81-85.

ABSTRACT: Static magnetic characteristics of Ni-Zn- and Cu-Zn-ferrites were recorded on toroidal samples by the ballistic method. The theory establishing a connection between the processes of magnetization and of the reversal of magnetic polarity and earlier confirmed on metallic ferromagnets proved to be correct also for the soft magnetic ferrites of the above-indicated compo-

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Magnetic Properties of Nickel-Zinc and Copper-Zinc Ferrites (Contd).

sitions. Individual experimental hysteresis cycles obtained by the author agree well with the theoretical ones calculated from experimental data on the initial part of the magnetization curve. The Rayleigh law which gives a linear relationship of the magnetic susceptibility from the intensity of the magnetic field is fulfilled in static conditions for the tested ferrites in a temperature interval from -196° to the Curie point. Losses for the magnetic hysteresis calculated directly from the areas of the individual cycles and those computed according to the known formula for metallic ferromagnets, which proves to be accurate in the Rayleigh region, coincide. A conclusion is drawn on the identity of the mechanisms of the magnetic polarity reversal of ferrites in weak fields and of metallic ferromagnets. Bibliography: 7 titles

V.A.F.

Card 2/2

Dependence of Electrical Resistance of Nickel-Zinc and Copper-Zinc Ferrites on Temperature

It was of interest to find whether this effect is observed in other ferrites. For this purpose the author studied the temperature dependence of the electrical resistance of certain nickel-zinc and copper-zinc ferrites. The results are shown in Figs 1 and 2, which give the function $\ln \rho = f(1/T)$ for a nickel-zinc ferrite (15.6% NiO, 36.4% ZnO and 48% Fe_2O_3) and a copper-zinc ferrite (5% CuO, 45% ZnO and 50% Fe_2O_3) respectively. Similar results were obtained for other ferrites. Figs 1 and 2 show clearly that above the Curie point the slope of the straight line $\ln \rho = f(1/T)$ for nickel-zinc ferrites decreases, in contrast to copper-zinc ferrites for which this slope increases. This means that the energy of activation ΔU at the Curie point changes differently in nickel-zinc and in copper-zinc ferrites. The change of the slope of the straight line $\ln \rho = f(1/T)$ at the Curie point indicates that the activation energy should depend on magnetization.

Dependence of Electrical Resistance of Nickel-Zinc and Copper-Zinc Ferrites on Temperature

Irkhin and Turov (Ref 1) showed theoretically that the slope of the straight line given by Eq (2) should change on passing through the Curie point and that the magnitude of this change should depend on the exchange interaction between the outer and inner electrons (this interaction changes at the Curie point). The experimental investigations confirm Irkhin and Turov's theory (Ref 1) both for nickel-zinc and copper-zinc ferrites. The difference in the temperature dependences of electrical resistance of nickel-zinc and copper-zinc ferrites lies in the increase of the activation energy in copper-zinc ferrites above the Curie point. There are 2 figures and 4 Soviet references.

(Note: This is a complete translation except for the figure captions)

ASSOCIATION: Ivanovskiy tekstil'nyy institut
(Ivanovo Textile Institute)

SUBMITTED: July 4, 1957

SUCHKOV, A.I.

Analytic basis for the form of a trawl. Trudy VNIRO no.47:144-154 '62. (MIRA 18:4)

ZIMIN, D.A.; SUCHKOV, A.I., otv. red.

[Physics laboratory manual: Mechanics and molecular physics; a textbook] Fizicheskii praktikum: Mekhanika i molekuliarnaia fizika; uchebnoe posobie. Ivanovo, Ivanovskii tekstil'nyi in-t, 1963. 60 p. (MIRA 17:9)